

Journal of Vernon Bailey

U. S. Department of Agriculture

Washington D.C.

1908.

July 25 Left Washington on B & O.
for Chicago and New Mex. at
5:30 P.M.

July 26 Reached Chicago at 5 P.M.
and left on Santa Fe Limited
at 8 P.M. for Albuquerque N.M.

July 27 - Reached Kansas City at
9 A.M. and Dodge City about
dark. The real short grass
and plains begins just west of
Dodge City,

Albuquerque

July 28 - Reached Las Vegas at
6:30 A.M. & Albuquerque at
12:20 P.M.

Got a horse and drove across
Rio Grande onto mesa west of river
and then back and onto mesa east
of town, and around the farms
along river valley on both sides.
Found no plant or bird or animal
to indicate a trace of lower Sonoran.

Found no good fruit, only scrubby
apple and peaches and nectarines
and little red plums. Hunted in
fruit stores and found no good
fruit except imported. There are said
to be some good ranches further
down the valley but none here.

Trees in town are mainly cottonwoods,
boulds, tamarisk, and peach & apple.
Tamarisk grows in great profusion.
A few Butterfly peas (*Parkinsonia aculeata*)
are in blossom in yards,

The native plants are -
Populus fremontii abundant along flats
Salix (narrow leaf) " "
 (yellow willow) "

Albuquerque

- ✓ Sarcobatus vermiculatus, abundant on flats
- ✓ Atriplex canescens .. "
- ✓ Euphorbia * big .. "
- ✓ Lycium pallidum seen before striking Rio Grande on creek flat
- ✓ Lycium green, same with pallidum before striking Rio Grande.
- ✓ Forestiera - Common along creek before we struck Rio Grande.
- ✓ Bigochia canescens (big) Common along creek down Apache Canyon.
- ✓ Chrysanthemus - (green & yellow) abundant over mesa and edge of valley flats
- ✓ Chrysanthemus? (big coarse shrub) abundant on flats & salt ground. same as found at Laguna & along Puerco.
- ✓ Gutierrezia - The most abundant plant over mesa on east side of valley.
- ✓ Baileya Abundant on flats on salt ground.
- ✓ Senecio douglasii, Seen here & there over all.
- ✓ Chrisena grandiflora, A little seen here & there.
- ✓ Hediondilla annua, abundant & big.
- ✓ Dalila canescens? The dominant plant on middle mesa section of both sides of valley.

Albuquerque

- ✓ Amorpha? (big) along ditches
in edge of town looks like mesquite.
- ✓ Glycyrrhiza lepidota? common on flats.
- ✓ Croton tetragonis abundant on dry sandy places
- ✓ Clavija integrifolia? " " " "
- ✓ Yucca glauca common on mesas
- ✓ Opuntia clavatium? " " "
- ✓ Hilatiopsum eriososorum, abn. on flats
- ✓ Anemopsis (big white) " "
- ✓ Solanum rostratum com.
" blue "
- ✓ Xanthium "

	<u>Trees in Albuquerque</u>
✓ <u>P. trinitatis</u>	abn.
✓ <u>Cottonwood</u>	com.
✓ <u>Boxelder</u>	com.
<u>Ailanthus</u>	"
<u>Catalpa</u>	"
<u>Morus</u>	"
<u>Tamarisk</u>	abn. & very thrifty.

To Mountainair

July 29 Left Albuquerque at 7 A.M.
for Balen and Mountainair on the
Santa Fe Cut off. About 10 miles
below Albuquerque and 2 miles before
reaching Isleta ^{minim} on east side of river
5 small bushes of dwarf Prosopis
glandulosa were seen on dry edge
of mesa, just below Balen on
east side of river valley 2 more small
bushes were seen and in the
foothills of the Manzano Mts. considerably
~~Prosopis glandulosa~~
dwarf mesquites was seen on hot slopes
in gulches. Just above and just
below Balen a few scattered bushes
of Prosopis ~~fistulosa~~ sppescens were seen on
wet bottom land, but only a few in
these two spots. No other change
in the valley flora was noted except
a long strip of half tree grasses 3 to
6 feet high that suggest Radiosa,
near Becker Station, about the middle
of the mesa east of the river.
The strip is narrow, half a mile or so
wide but extends out of sight to the
south. As yet there is nothing
on which to map Lower Laramie.

After crossing a wide grassy plain we entered the west foothills of the Manzano Mts. at 4500 feet and there struck Juniperus macrocarpa, Yucca baccata, Molina, Opuntia arborescens, Celtis and a little farther up at 5700 feet Pinus edulis monophylla. Hence on to Mountainair the whole country is covered with junipers and nut pines as far as you can see on all sides. A few little Mexican ranches are scattered along. Mountainair is at the summit and is said to be 6600 feet. It is about 15 miles east of the Manzano Mts.

Got a horse & buggy & started after dinner for a saw mill in the Manzano Mts. to stay all night and climb the peaks and come back tomorrow - Drove through beautiful juniper & nut pine country about 10 miles to where the yellow pines and oaks & checker ^{marked} junipers begin at 7000 feet. Then on to Spencer's Saw Mill (Eastview) at 7400 feet then a mile & a half ~~up~~ ^{and west} to Dennis Mill at 7700 feet & staid all night.

Canadian zone plants. Manzano Mts.

<u>Abies concolor</u>	abn.	8000 - 9600	N.E.
<u>Pseudotsuga douglasii</u>	"	8400 - 10000	"
<u>Pinus pungens</u>	com	9000 -	"
<u>Populus tremuloides</u>	abn.	8000 -	"
<u>Acer glabrum</u>	com	" - "	"
<u>Rubus neomexicana</u>	"	7800 - 9700	"
<u>Salix</u> big.	"	9600 - 10000	
<u>Sambucus glauca</u>	"	" - "	
<u>Holodiscus</u>	"	" - "	
<u>Oculaster</u>	"	8000 - "	
<u>Delphinium</u> big blue	"	9000 - "	
<u>Polygonum</u>	"	" - "	

Transition Zone plants.

<u>Pinus ponderosa</u> abn.	7000 - 8000	N.E. to SW.
<u>Quercus gambelii</u> ? "	" - 9600	
<u>Juniperus pacifica</u>	" - 8000	
<u>Berberis riparia</u>	7800 - 8000	
<u>Ceanothus</u>	" - "	
<u>Pentstemon barbatus</u>	7000 - "	
<u>Catalpa</u>	" - "	

Manzano Mts.

July 30, Got up early & started up the hill at 5. Leaving Duran's mill I followed a lumber road N.W. up the gulch through open yellow pine timber about 2 miles to narrow part of gulch where Abies concolor, Populus tremuloides and Acer glabrum begin on the cold slope at 8000 feet. On hot slopes they begin at about 9000. The first Pseudotsuga taxifolia Douglas spruce were seen at 8400 feet and they reach the top of the peaks at 10000 while Abies concolor stops some 400 feet short of the top. It rained and was cloudy or foggy all the time I was on the Mts. so I could not see far, but went up a peak said to be as high or almost as high as any. The average road 10000 feet on top, 9600 feet on top of main ridge. The east slope is heavily timbered with Abies concolor, Pseudotsuga, Populus tremuloides, Aspen, Salal, Pinus pungens & Aspen. Steep where fire has swept over the Quercus gambelii thickets of oak have come up. There are many springs and a small creek in the gulch went up. Grass & weeds are luxuriant.

Wangara Mts

Mr. John Lee, who is working for the mill co. & has been Forest ranger, says there is no timber of value on the Wangara Nat. Forest, that all the good timber is owned by lumber co's.

Settlers are coming into the Juniper country and starting farms & some have good crops.

The old Apple trees at Wangara are said to be over a 100 years old & very large, but the apples are little & poor, evidently ungrafted seedlings.

Few mammals were seen.

Cynomys ludovicianus were common near East View

Nitona albicula? Woodrat houses are numerous in the Juniper country.

Odocoileus hemionus - Mule deer are said to be common in the mts.

Antilocapra There are said to be still lots of Antelope on the plains east of the Wangaras. A man was arrested with 3 that he had killed recently.

Ursus Black & brown bears are still common in the Wangaras.

San Marcial Plants

Populus wislizenii, abundant on river flats

Salix narrow leaf "

" wide leaf "

Prosopis pubescens, screw beans are common over bottom lands, often in thickets.

Prosopis glandulosa - Common along edge of river valley and up the washes as far as I went - to 17 miles west.

Usually low and in wide bunches.

Pluchea borealis, common in places on the flats.

Rhus microphylla - " in washes and along edge of valley. Extends back to 17 miles.

Chiropus linearis, a few in lower washes.

Corylea tridentata, abundant on lower washes and hot slopes back to 10 miles.

Often the dominant plant for miles.

Some still on hot slopes at 17 miles west.

Taxodium bicolor: common in washes & on mesa.

Turritis glabra - common on mesa

Baccharis glutinosa - Common along the flats (bottom).

Ephedra trifasciata (big gray) Common in the washes and on mesas.

Ephedra (low blue) A little on mesa.

Fatheria pandoria, common in washes.

San Marcial

July 31. Came from Mountainair in the night & woke up at San Marcial. Got a horse & buggy and drove west to get into the San Mateo range but could not make it in one day. Went near enough to see the timber on this & a range to the north of it and on the Mescaleras. Went about 19 miles on the Rosedale road & then turned back. The mts are not high enough for Canadians but the tall yellow pines begin about half way up and go to the tops of all 3 ranges. Nut pines & Juniper cover the lower slopes and foothills.

Lower Sonoran zone is strongly marked along the Rio Grande valley & back on the lower mesas about 8 or 10 miles west of the river. It follows up large washes on the hot slopes to 17 miles west on the Rosedale Road.

On the river flats the dominant plants are ^{Populus} Cottonwood, ^{Prosopis} Screw bean, ^{Prosopis} Glandulosa, ^{Acacia} Mesquite, ^{Pluchea} Borealis, and Rhus microphylla.

San Marcial

- Yucca radiosa? (low) Com. over mesas & in washes.
" baccata (large) comon on mesa back 10 miles
 mostly beyond Crocote bush.
- Opuntia engelmanni? a few small plants seen
 that seem to be this form.
- Opuntia lophioleptera (long brown spines) com on mesa
 " adormentata comon on mesa, mainly
 on cold slopes or farther back.
- " obovatum, abundant on hot mesas.
 " (white spined) com. upper mesas
 " (fin spines)
- Quercus grisea, A few on mesa 19 miles west.

Mammals

- Citellus spilosoma, many heard
- Urocyon nigeropus, houses numerous
- Perodipus burrows "
- Dipodomys spectabilis, Mounds numerous mesa,
 first seen about 6 mi. back, not many with
 Crocote bush.
- Lepus texianus com
- " micros "
- Thomomys high hills com in valley,
 little hills scattered on mesa.

San Marcial

Cylindropuntia whipplei
 on the lower mesas Creosote, Yucca
 Berberis glutinosa, green and blue Ephedra,
 a Yucca between radiosa & glauca, and Gutierrezia
 are the abundant shrubs. There are several
 species of cacti. The Creosote keeps on
 hot slopes and avoids the local cool
 slopes, down to the valley. It also thins
 out on the mesa 6 to 10 miles back and
 follows only tongues of south slopes,
 but follows some of these back 17 miles

The Rogers Ranch in a big
 wash 17 miles NW. of San Marcial
 is the only inhabited place seen
 out of the river valley, but back
 in the foothills are lots of ranches
 & towns. There is a little grass
 over the mesa & a few horses.

Farming along the Rio Grande
 valley is of the Mexican type,
 little green patches & scrubby
 unkept apple and peach trees.
 The only fruit I could find was
 with hard seeds apples

San Marcial Birds

<u>Zenaidura macroura</u>	- com.	316
<u>Callipepla squamata</u> , comon all across mesa.	293	
<u>Buteo b. calurus</u> , several seen on mesa	3376	
<u>Falco s. phaeonotus</u> , one seen on mesa.	301 a	
<u>Cathartes aura</u> , " "	325 396	
<u>Dryobates s. bairdi</u> , one heard in wash bottoms.		
<u>Tyrannus vociferans</u> , com. on mesa.	448	
<u>Contopus richardsoni</u> , seen feeding young in town	462	
<u>Geococcyx</u> , several seen on mesa.	385	
<u>Taiinus</u> , " " "	622 a	
<u>Otocoris</u>	" "	474
<u>Melanerpes leucostigma</u> 2 seen "	" 605	
<u>Amphispiza bilineata</u> , comon in places a a	573 a	
<u>Passer domesticus</u> , abundant in town	P. d.	
<u>Mimus p. leucophrys</u> , com.	703 a	
<u>Heliobdylus</u>	Nests comon in Cactus	713

Reptiles

<u>Phrynosoma hernandesi</u>	, one found on mesa
<u>Sceloporus</u>	one small one seen.
<u>Cnemidophorus</u>	com.
<u>Holbrookia texana</u> ,	one seen.

San Marcial to Misilla

Aug. 1. Found the same Lower Sonoran plants along the river valley a few miles below town. Then turned up mesa and up the north slope road of the Lower Sonoran species disappeared or were replaced by Dalea canescens, Gutierrezia & Yuccas of the low radiosa type. Across the lava beds, and in fact all the way to Engle, it is so close to zone limit that the least slope makes a difference. Creosote, mesquite, Baileya glauca covering the warm end, Gutierrezia, yuccas & grasses covering the cold. After passing Butler the slope is generally to the south & creosote, mesquite & tall Yucca radiosa predominate, becoming larger & more abundant down toward Pinos.

The Valley Jardines del Muerto is unusually green and grassy just now with rainwater standing in many basins, tanks & runs. Lots of horses & cattle were seen.

Misilla Park

Drove out over the valley and around the experiment station, Agricultural college and Las Cruces. Then went back to the college and talked with Prof. Wooten till dark. Saw the collection of birds and mammals and plants and got some good plant names and a few important records for birds and mammals. There were several skins of Archibates flaviceps from Misilla and a skin of Spermophilus verdandieri and one of Nyctinomys.⁷⁴⁶ The odor of Nyctinomys was very strong in my room in the adobe hotel and as I passed some of the old adobe houses in Las Cruces. Bats were numerous in the evening - probably of this species.

Mesilla to El Paso

Aug 2. Plants are the same all the way down to El Paso, until we reach the bare bluffs where ~~Agave~~ ^{Agave} Leymus and Aztecia constricta begin. These go farther north along the mts. but were not seen farther up the river valley.

Great forests of Prosopis pubescens cover the flats in places on land occasionally flooded. Bocconia glutinosa holds the regular flood land.

There is much good agricultural land on the flats but little of it is cultivated.

At Mesilla good drinking water is pumped up from 75-800 feet down and on some of the ranches here pumping plants for irrigation.

El Paso to Dressing

Aug. 2.

West to Laramie Creek &
~~Pricklypear~~ ^{Cocillea tridentata} are abundant, but here
they get scarce & Yucca radiosa
& big green Ephedra & grasses are
the main vegetation. This is
on top of the plains & lower savan-
as is not pure.

Dipodomys spectabilis roads
begin at Salado and are then
common westward.

A herd of ~~Odocoileus~~ ^{Odocoileus} was seen at
the point of Rock rock.

The highest point on the road is
near Colby and even here there
is considerable ^{Plains} ~~desert~~ low mesquite, lots
of tall Yucca radiosa, Ephedra ^{tridentata}
occasional patches of ^{tridentata} creosote
and ^{very} ~~few~~ ^{few} Zizyphus, but where the
slope dips to the north all of
these disappear.

These high plains, while largely
lower savans are not pure,
and are so close to upper savan-
that a slight incline to north or
south throws them into the
other zone.

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- ✓ Cornus cryptoleucus, several flocks seen
near Lamartre and Aden & Cambrai.
- ✓ Callipepla squamata, seen near Cambrai.³⁹³
- ✓ Geococcyx ³⁸⁵, Several seen, near
Aden & Cambrai

Lepus talianus, common all along
~~spur river~~
Dipodomys spectabilis. " from Laramie to
Denver.

Cainagra

Cainagra - is the Mex. name of Rumex alata, which grows abundantly in the sandy soil around Deming. It has big fleshy roots like carrots, dark red or astrigent like rhubarb.

Hatchkiss tells me this is extensively used in tanning leather & that a tannery was put up at Deming to utilize it. A ranch started to raise it.

Says it dyes very well but colors the leather very dark red. He has used it on buckskins. He says the root sells for about \$8 dollars a ton & on wild sand a ton can be plowed up on a few ~~seeds~~.

This might be a valuable crop for sand that will raise nothing else. It grows native in the Nebraska & Kansas sand hill regions & where nothing else will grow. The roots are storhouses for moisture.

To Silver City & back to Deming

Aug. 3. From Deming to Faywood or beyond the second crossing of the Mimbres, Lower Sonoran shrubs are abundant. ^{P. J. Deacon} Low mesquites, big green Ephedra, Zizyphus, Gutierrezia, and tall Yucca radiosa. From the lower Mimbres to about 6 miles south of Silver City it is grassy plains with very little else, except a few Yucca radiosa on south slopes. Then real Upper Sonoran species begin on the foothills, Nolina, Juniperus pauciflora & monosperma, Quercus arizonica, Mimosa pinnaea. The Yucca radiosa stop abruptly where these plants begin.

The question is whether to way the neutral grassy strip as upper or lower Sonoran? The same question applies to wide strips east & west of Deming. It is not pure (or strongly marked) lower Sonoran, but aside from grass there is not an upper Sonoran plant.

Dining to Watkins Ranch (30 mi SW.)

Prosopis glandulosa - common & big on all sandy soil
Covillea tridentata, abundant & big on high gravelly mesas
along south slope of Red Mt. & last 10 miles of trip.

Zizyphus. Abundant & big on all sandy soil.
most of the way.

Koeberlinia spinosa, abundant & big about 10 miles across
plain south of Gage.

Flourensia cernua, abundant on gravelly soil
with *Covillea* & in spots between.

Lycium Andersonii?, abundant by spots all day.

" *pallidum*?, a few small bushes seen.

Yucca radiata, tall trees common all day.
" *macrocarpa*? a low form 3 or 4 feet high
common last 7 miles.

Ephedra trifurcata, abundant first 20 miles,
some all along.

Atriplex canescens, common on alkali land.

Opuntia leptocaulis, a little seen in several places.

" (brown spined) " " "

Antennaria, common on flats where
nothing else grows and on some of the mesas.

Athanasia filifolia, common on some of the sand-

Prosopis glandulosa, abundant on sandy
soil, in washes, & on slopes.

Dining to Watkins Ranch

Aug. 4th Left Dining at 10 AM &
made about 30 miles S.W. to
a cattle ranch belonging to Mr. Watkins
(The Condite Ranch) Aneroid set at 4330
at Dining read 4400 at the wind
mills south of Gage and 4600 at
the ranch at camp. The country
seems perfectly flat except a
slight rise in the last 10 miles.
There are many flats, almost playas,
but mostly covered with "gavetta" grass
or gutierrezia. There are also wide
strips of sandy soil blown into
dunes around the mesquites and
Zizyphus bushes where little else grows.
Then on the foot slopes of the buttes and
ranges there is gravelly mesa
covered with a good growth of
Crocosmia and *Flourensia cernua*,
and *Lyssum Andersonii* for 8 or 10
miles across the barren wash
where the windmills are (south of Gage)
there is abundance of *Koeberlinia*,
big bushes and commonest shrub.
The whole distance is pure Lower
Sonoran as shown by the abundance
of big mesquites where it grows, the

Deming to Watkins Ranch, 30 m. SW.

abu

Hirundo

Birds

Numerous in Deming, a few
still hanging around nests under hot pizazas.
Passer dominicus, Abundant in Deming

abundance of creosote bush on the highest land and the predominance of Lower Sonoran & absence of Upper Sonoran species.

Mammals

Antilocapra, my driver says he saw 3 about 7 miles west of Deming a month ago.

Citellus spilosoma, common, often heard or shot.

Thomomys houses numerous

Desmodonys spectabilis, common on ~~places~~, highest slopes, especially on the side of Red Mtn. & near the Watkins ranch, not common across bottom of plain.

Lepus arizonae, common.
" *texianus* "

" (white-sided?) 2 shot & seen
& half a dozen more seen, about half as many as of the gray.

Cynomys ludovicianus, a few near Watkins Ranch, hills common in places all along.

Canis; Coyote tracks & howls common.
Taxidea, numerous old barrows.

Watkins Ranch to Hatchita & Valley de las Playas.

40 miles.

Aug. 5. Left ~~Whitney~~ Watkins ranch (4400) and followed up easy grade to pass in first ridge about 6 miles west (at 5000) then down across a wide valley about 10 miles (4700 at bottom) then over another low ridge at 4800, and down about 5 miles to Hatchita (at 4575) avoided reading 70 ft too high)

Got mail & supplies and struck west for Adobe Spring, crossed valley bottom (at 4450) then up long wash to deserted ranch at 8 miles, (good water, no grass) then about 5 miles farther up to summit of ridge near Goldfield (5100) Then down the west slope about 5 miles to Whitmire ranch at bottom of Valley de las Playas. and camped on east side of flooded playa.

Except for north slopes and higher parts of the 3 ranges crossed we were in pure and strongly worked Lower Sonoran zone all day.

Most of the Lower Sonoran species, such as ^{Handroanthus} ^{Leptadenia} mesquites, ^{Tridentia} acacias, *Karwinskia*, *Rhus microphylla*, and others go through each of the passes on south slopes, while ^{Commelinaceae} Fouquieria and other species are abundant only along the mountains.

Along the crests and north slopes of
the ^{main} 2 ranges Upper Sonoran species such
as *Juniperus monosperma*, *Dasylinum*, *Nolina*,
Schoenocleisianum, *Cassia*, *Mimosa fuscipara* &
Agave take the place of the valley species.
None of the ranges have any timber except
an occasional juniper. The big agaves
go to the top of peaks at least 500 or 1000
feet above the passes. The little range just
west of Hachita has no junipers or agaves
near the pass and is so low as to be
much mixed with Upper Sonoran
species.

We reached the Valley de los Playas
late and found the big central playa
flooded while other sheets of water could
be seen to the north & south. We started
to cross the big playa near the middle
but found the shore muddy & as it
was getting dark were afraid to risk
it as we could not tell how deep
the water & mud might be.

So camped on the east side in plain
sight of ranches & good water on
the west shore. The horses drank
some of the alkaline water & we used it
for washing but had enough in our canteens.

for the night. We had a beautiful camp place among mesquites with abundance of grass and enjoyed the glorious night under the more glorious stars. The valley is overstocked and the grass killed out over most of it, but a broad zone of *gavetta* and *sacahuas* surrounds the flats and supports a large number of horses & cattle & ^{Cervus} ~~Jack~~ rabbits. The rabbits have gathered in the grassy land and a dozen at a time could be seen feeding. Other rodents were also abundant and the sandy soil was tracked up with rats & mice. *Dipodomys spectabilis*'s round and *Neotoma* houses are a conspicuous feature of the landscape.

Playas to Animas Valley & Mts.

Aug. 16 Crossed the playa without any trouble & found the water only about 4 inches deep and the bottom solid. The water is thick & creamy and alkaline. It forms a lake 3 or 4 miles long & half a mile wide.

On the west shore are some cattle ranches and springs of the best water we have found since leaving Durango. Cottonwoods & willows grow on the wet ground. From here we struck west to a low pass in northern part of the Animas Range. Passing at 5000 feet and turning south along the east side of Animas valley we kept at about 5500 feet to 12 or 15 miles south of the pass to "the Adobe", a cattle camp on Double Adobe Cr. at 5100. Here we learned that ~~boys~~ were Goldman & Birdseye were in a canyon about 4 miles farther south, so we pushed on and got into camp about 5 P.M. at 5800 feet in Apache Canyon at north base of Animas Peak.

The camp is in an open live oak gulch with only pools of water.

Animas Mts.

Aug. 7. Followed up Indian Canyon from camp around east and south of Animas Peak to top of the first peak south of Animas. This peak is 5000 about feet lower than Animas Peak (both our aneroids read 8000 on top) but has much more timber on it. Deer Creek heads on its S.E. slope and Indian Cr. on its N.E. From this peak we were able to map the country pretty fully as we had a clear view of the Peloncillo and San Geronimo Mts. on the west, the San Luis range to the south, the Huelitz, Dog Mts., Boca Grandes, & Hermance on the east. Even the brushy lower Sonoran valleys, covered with mesquite & creosote, could be distinguished from the smooth, grassy upper Sonoran valleys & slopes.

The Animas range is all volcanic, and the group of high peaks may well be remains of old crater rims. The high part does not extend more than 10 miles along the middle of the range, but the low ridges run north & south. Upper Sonoran zone covers most of the range & the valley slopes.

east & west, as well as the big valleys S.E. & S.W. and goes up on south slopes to the top of Alivias Peak at 8600.

Transition zone covers the cold slopes from about 7000 feet to the peaks, ~~the~~ ~~a~~ ~~trace~~ ~~as~~ ~~as~~ ~~low~~ ~~the~~ ~~canyons~~ to about 6500.

It is marked by *Pinus ponderosa*, *P. arizonica*, *P. chihuahuana*, *Quercus hypoleuca*, *Q. gambelii*, *Q. reticulata*, *Pseudotsuga* and many shrubs & plants.

A trace of Canadian zone is found in many small patches of *Populus tremuloides* in N.E. gulches and by a clear stand of *Pseudotsuga* & *Pinus flexilis* on the steep upper slopes above 7500 feet.

Saw lots of bear signs and some fresh and old tracks. The sign was mostly composed of *Mazama venia*, some old contained acorn shells and one lot was entirely filled full of pig hair. Some of the deposits were very large (of 2 inches caliber) and some of the old tracks were large. One fresh track of a yearling was seen. Great numbers of stones have been turned over at good

bear trails follow the gulches where no stock goes. There is water along the upper part of the canyons, good pure cold running streams, and the bear trails follow the canyons to water.

There are a few blacktail deer in the foothills & lower slopes of the mts., and the little white tail is abundant on top of the range. Their tracks are numerous all over the ridges in beautiful park like country where no stock runs & few people ever go. Three old bucks were seen at 7800 feet, lying on an open slope of the extreme head of Deer Creek. One shot was in its gray coat & with half grown velvet horns. Its stomach ~~contents~~ was full of mainly leaves & twigs & seeds of *Aesculus p. parviflora* & a few *geranium* & other stems. The deer would have weighed about 100 lbs.

We saw a fresh mountain lion track. saw *Batrachium dorsalis*. *Thomomys fulvus* tails were seen up to 7800 feet. *Lepus holurus* is common to near peak.

Fireflies

In the evening at our camp long streaks of pale light went swiping by so different from eastern fireflies that I got my gun and killed several of the insects. They proved to be Elater ^{insect.} butterflies ~~Pyrophorus~~ Pyrophorus physodeirus, with a flashlight on each shoulder. They were an inch or more in length and their rapid flight and long sustained light was startling in effect. I brought some back and Mr. Atte identified and put them in the scientific collections.

There are 7 species of oaks and 5 species of pines & Pseudotsuga & Arbutus and Manzanita & ash & box elder & aspen & ash & walnut & sycamore & trees agaves in the cuts. But no extensive bodies of timber. There is much chaparral too dense and large to get through conveniently and a great protection to the water supply and to game. Stock does not get into the cuts. & best of all there are no trails and no one goes up them on horseback so they are rarely entered.

At the Gray Ranch I am told that black brown & silver tips bears are found in the - & that the bear kill a good many pigs on one ranch east of the Ruth.

Animas Valley

Aug. 9. Followed down Indian Creek ~~to~~
~~the~~ wash to the dry bed of Animas
Creek, at 4800 feet. Then south up the
valley about 10 miles to the Gray Ranch,
at 5000 feet. This is a broad
grassy valley some 10 miles wide
between the Animas^{mt.} & Cloordale Hills.
At the mouth of Indian Creek there is
a strong trace of Lower Sonoran with
much Mesquites & Chilopsis & Yucca radiata
old ~~Heliocidites~~ roots, lots of rockin' buds,
etc., but south of here there is scarce
a trace of Lower Sonoran.
There are almost no bushes, and
the heavily stocked slopes are grassy
or barren. A few stunted ~~cacti~~ cacti
& much dwarfed mesquites are scattered
on south slopes and a few ~~cacti~~ cacti
bushes are seen. Live oak bushes
come down washes on both sides,
and a few ash & maples & Bumelia
bushes or trees grow along wash
banks.

There is no water in Indian Creek
or in Animas Creek except in the
~~g narrow place on the Gray Ranch~~
~~ranch where the creek cuts through~~
~~a lava ridge & narrows at~~

The Gray Ranch is an old place now owned by the A. Diamond A. Cattle Co. who control Animas & Playa Valley ranges. It is the ranch where Geronimo was brought when captured and is now merely a head quarters for cattle men. It lies on the opposite side of the valley from and just south of the middle of the Animas Mts. Some big meadows and bottom pastures fenced in make excellent horse pastures.

We reached the ranch at 2 PM. Were invited in to a good dinner & I then saddled up & started for a bat cave in the Orogralde hills 7 miles west. Found it in the bank of the wash north of Clinton Creek, up in the foothills.

The cave is a washed out place in a cliff of volcanic scoria & ash and baked rock full of great chunks of obsidian. It is 20 feet wide and 10 feet high at first but soon narrows down about 50 feet back and then extends in a low tunnel as much farther.

but not high enough to stand up in.
In domed section about 40 feet back
I found a mass of bats hanging to
the roof like a swarm of bees.
They were packed in a body 3 or 4
feet long and a foot to 18 inches
wide, hanging head down. As I approached
many flew out and circled about in
the cave, so, for fear of scaring them
I backed part way out & shot into
the mass with the gun three times.
At each shot a mass of bats dropped
but a few still clung to the roof
when I went up & picked them off.
I gathered up my pocket full of
bats and outside counted 92
of them - 4 Nyctinomops and the rest
a little yellow bat.
Outside I saw 5 *E. coronatus*
pallidus flying about in the
sunlight, probably driven out of
the cave by my shots. Some of
these went back into crevices high
up in the cliff and some into an
old hollow tree. I shot one at
the tree but the rest escaped.

The cave has been located as a mining claim and is supposed to hold valuable guano. There is probably 20 bushels of dry fecal dung & dust in the cave and below this dry loose earth. There are a few small bones in the dirt, but not enough in sight to be of importance. The floor of the cave is dry and slopes down so as to be perfectly drained & digging would probably disclose some good bone deposits.

The creek valley at the bat cave is a beautiful place to camp, good running water, a flat valley bottom with open parks & groves of live oaks and big spreading single trees, between the cliffy borders. One large Chihuahua pine grows by the creek and lots of cones along the creek banks indicate more pines above. There is said to be a patch of yellow pines farther up in the hills but most of these hills are upper Sonoran oak & juniper covered.

To Lang Ranch & Monument, ~~to~~ Mex. Boundary

Aug. 10, Left Grays Ranch at 5000 and drove 17 miles south to Lang Ranch at NE base San Luis Mts. at Monument ~~22~~ Mex. boundary Survey & camped for the night. about half way up the valley we crossed a ridge 100 feet high (5200 feet) that forms a divide and makes a great playa or lake bed south of it, 6-8 miles across. The valley all the way is open, grassy & barren mesa, 10 or 15 miles wide between the Anchos & Clovis Mts. & southward as far as we could see into Mexico between the San Luis & a little range south of the Clovis Mts. The valley is all Upper Sonoran, no trace of much dwarfed mesquite is found on all south slopes. Yucca & live oaks grow along the borders & junipers & oaks on the foothills.

The San Luis Mts are high and black with timber, extensive bodies of oak low down, and tall pines along the crest and upper slope.

Very bad from recent rains & grass is good over the

valley where it has not been killed out by overgrazing. Thousands of cattle are ranging over the valley. The great playa or lake bed is green with weeds but has grass in only a few spots.

We saw 4 antelopes, all singly; and the cowboys at the ranch say they see them every day in bunches of 3 to 17. Bundles of 27 & 35 are reported seen last winter.

White sided pocket rabbits are said to be frequently seen along this valley but we did not see any.

Prairie dogs are numerous all the way and must do great damage to an already over taxed range.

Dipodomys spectabilis bands are common all along on dry mesa but not on the playa.

Prairie dogs and porcupines are abundant over the weedy playa. A Citellus spilosoma was seen on edge of playa. Badger holes are common all along. Sigmodon are said to be numerous around the water places at the Lang ranch. In evening Bidsay shot 2 house bats so Golden caught

an autogas pallidus in the house.

Some large springs come out at
the ranch ad make few acres of marsh
around in tanks of good water.

The ranch is one of the ~~best~~ cattle
camps of the A. Victoria Land & Cattle Co.
There are 5 cowboys breaking horses
& raising feed - a good hearty rough
lot.

The Lang ranch is a historic old
place for Indian fighting & survey
work. The house is old of adobe
on an open mesa.

Lang Ranch to High Lonesome in Playa V.

Aug. 11. Left the Lang Ranch and followed north along sides of playa about 6 miles, then turned east over San Luis Pass and down to Culberson Ranch on Deer Creek, then out onto the south end of Playas Valley and about 4 miles north to High Lonesome, in the middle of the valley, another ranch of the A Cattle Co. Averiod at Lang ranch road 5100, on top of pass 5500, at Culberson Ranch on Deer Creek 5000, and at High Lonesome 4750.

The pass is all Upper Sonoran, mostly open country with short grass, *Nolina*, *Agave palmeri*, *Quercus emoryi* + *arizonica* along gulches, a few *Tamias* *polypodioides*, the big thin leaved *Yucca*, and *Catclaws*. Down along Deer Creek we found *Platanus wrightii*, *Frasinus*, *Celtis*, *Morus*, and *Liquidambar* oaks and on hot slopes *Acacia* *tridentata* mesquites and along hot bottoms *Chilopsis*.

The lower part of Deer Creek where it opens out onto the valley and the big valley are Lower Sonoran.

rather open and grassy in places
and again densely covered with
Mesquites & tall *Yucca radiosa*.

There have been recent rains and
grass is good and stock numerous.
Water is pumped by windmills at
the ranches and cattle range act
several miles on all sides.

There are sinks of good *Zizaniopsis* grass
flats and lots of better quality of grass
on higher ground. The soil of the
valley is excellent and will some day
be worth irrigating by pumping.
The water is good at all of the
wells we have struck in both the
Playas and Animas Valleys.

Mammals

Antilocapra macroura, One seen near the
Cienega + 13 reported in a brush a north
apo near High Lonesome.

Ovis Mexicanus, Said to be a few in the Hatchets.
Odocoileus canadensis, A big buck said to be seen
frequently on Walnut Cr.

Citellus spilosoma, Common all along in
Playas Valley + in Hachita Valley.

Cynomys ludovicianus, Common in many
places in both Playas + Hachita Valleys.

Often so numerous as to kill out the grass.

Micromys albicauda, Houses abundant in
both Playas + Hachita valleys. Often
very large (to 10 bushels) + usually in
Cactus, Yucca or Kotschya.
Made of sticks, chips, dried day
from road etc.

Dipodomys spectabilis, Roads common
on higher ground in both valleys

Thomomys hills all day.

Lepus texianus, Common.

" *arizonae* "

Bodger holes common.

Cavia nevadensis, Heard bawling, tracks
common.

High Lonesome to Hachita - 40 miles

Aug. 92. From High Lonesome in south
end of Playas valley (405 mi. Nogales)
we came north through gap between Hatchet
+ Hachita mts. + up the valley to Hachita,
said to be 40 miles. Aneroid at camp
read 4700, at Cienega Ranch 44, at
Hatchet ranch 4350 at Hachita 4600, ^{1000 feet to top}.
The road is excellent most of the way
and all down grade to the gap
between the Hatchet + Hachitas. The drainage
of the Playas Valley is east through
this gap into the south end of Hachita
valley + then evidently on to the S.E.
Hachita valley rises to the north, while
Playas and Arivio valleys are
higher to the south.

The whole trip today was
in Lower Sonoran zone, with
extensive flat grassy areas but
the upland and dry soil covered
with *Yucca whipplei*, *Mesquit*,
Ephedra trifasciata, *Zizaniopsis*,
Florencea armata, *Nolana*, *Lycium*
andersonii & *Atriplex canescens*. On
the higher side slopes in the gap
Covillea + *Toumeyera*. Also *Cotyledon* near
Hachita.

Habitat to Lordsburg -

Aug. 13 Packed specimens all of person.
Sent the team back to Deming &
took train around to Lordsburg,
but had to lay over night and
get a morning train to Deming.

The valley is Lower Sonoran all
the way from ~~Hechito~~ to Deming
with abundance of ~~Gilia~~ ^{Gilia} ~~Acacia~~ ^{Citrus} ~~Acacia~~ ^{lindleyi}
Mesquites, *Croton*,
Houensia cernua, *Ephedra*, *Zizyphus*,
& *Mucuna radiosa*. There are extensive
grassy flats or flats bare of even
grass, but evidently trees as well
as the brushy parts of the valley are
Lower Sonoran. Grass is short &
poor except on some of the flats.
The rains seem to have missed
this section tho just north of
Lordsburg the grass is said to
be green and abundant & rains
have been frequent.

A very shower can be seen to
the south, about the Animas Range.
and others in more distant sections.
The rains are mainly narrow
and but frequent and often violent.
The showers gather around the peaks and
then cross valleys from one range to another.

They gather around the high peaks of the Hatchets, Animas, San Luis and Chiricahua Mts. and cross back and forth over the valleys between, consequently keeping these valleys much greener and more grassy than in the more open country from Hatchet to Lordsburg & Deming.

Aug. 14. Lordsburg to Deming and up to Silver City. Found Hatchiss is still off on a camp trip, so began on reports and notes.

Aug. 15. Got saddle horses and rode up the creek valley about 5 miles north of Silver to where the big agaves and yellow pines are common on the cold slopes and the ^{open} ~~open~~ pines on the creek flats. They begin at edge of forest Pines, and extend around and up the back of Pinos Altos. ^{large} ~~large~~ ^{major} Walnut trees are abundant along the creek valley from back of Pinestones place to the yellow pines, some trees are 2 feet through and 40 feet high with a spread of 50 or 60 feet.

They are loaded with good sized nuts which are ripe and falling off. I collected a good series of branches & nuts & sent to Sudworth in the hope that he will recognize the well marked species of *F. major*, instead of calling it rupicola.

Aug. 14 to 18 - Remained at Silver City, writing reports and making preparations for the trip.

Aug. 19 Started with team and camp supplies to the GOS ranch to find Hobkirk and by accident good luck he had just come in to the GOS ranch from his camp on Big Rock Cr., about 15 miles N.E. Made arrangements to go to his camp and start with pack for them.

On the trips over we found good crops and abundance of fruit along the Rio Minibos. Apples, pears & plums are loaded with excellent looking fruit, & peach & cherry trees are past fruiting but in good condition.

Starts to copy notes from
him. 7-25-11

last

Populus angustifolia

GOS Ranch to Terry place.

Aug. 20. Got our maw to haul our
stuff over the North Star Mesa and
down into the Terry Canyon
as far as we could go with the
team. Here we camped in beautiful
yellow pine woods to wait for the
pack outfit & sent out team &
maw back to Silver City.

Aug. 21, Hotchkiss & his nephew came over
in morning with 8 horses & a mule
& moved camp over onto Big
Rocky Creek, about 5 miles farther
north. This is a yellow pine & Douglas
spruce gulch at 8000 feet with a good
stream of clear cold water, steep
rocky sides covered with timber,
a mixture of nut pine & ^{Populus tremuloides} ~~monilifera~~
juniper oaks & yellow pine on south slopes,
yellow pine, Douglas spruce & pines ^{Populus tremuloides}
on cold slopes. A few Aspens
begin a mile above in cold gulches
and Populus angustifolia follow up
the creek a mile or two above camp.
There is abundance of good grass
over the ridges on both sides &
lots of wild oats cheses in places.

Mammals. Rocky Cr.

- Odocoileus hemionus*, Gr. low down
" *cavisi* Can. high up to peaks,
mainly transition.
Sciurus aberti Can. in yellow pines
" *magellanicus*, Common in Canadian
Eutamias amoenellis " - transition & above
" *dorsalis* " upper slopes
Callospermophilus lateralis, " in transition, 8000-10000
Peromyscus sonoriensis, at 8000 feet in woods
Neotoma magellanica, Common in transition.
" *oreocetes*, " Canadian, many
houses seen up to 9000 on cold slopes
Thomomys fulvus, Common.
Urocyon scotti, "
Uroplatus, " this transition.
Canis macrourus, " lower down.
" *mexicanus*, No signs of wolves tho a
den was found just above camp
last year in the gulch at about 8500.
Felis astrea, Still a few.
Lynx baileyi Common.
Urocyon amplus, Common.
" *horriacus* Scarce.
Taxidea
Vesperomys fuscus
" *virgatulus* Common.

Rocky Creek

Aug. 22 - Caught but little in our
traps but shot Chipmunks, *Callospermophilus*
+ birds. Abst squirrel + birds.
Shot a painted redstart + red faced
warbler, both in pinfeather condition
+ evidently breeders. Found houses of
Neotoma orophiles. in Canadian zone timber
on cold slopes at 9000 feet,

Aug. 23 - Went up to Quaking Asp Peak
above the spring of same name about
6 miles east of camp. The ground
at camp read 8100, at Spring 9000
on peak 9750. Found dense Canadian
Zone timber of *Aspens*, *fir*, *Douglas*
spruce + *Pines flexilis* (*or strobiformis*)
on cold slopes above 8500 feet
and on top of ridges above 9000 feet.
but Transition yellow pines runs to
top of peak on SW slope.

Found plenty of *Sciurus magellanicus*
and houses of *Neotoma orophiles*.
The aspens are all tracked up with bear
near the spring. Rained most of
the time so we couldn't do much.

To Diamond Cr.

Aug. 24. Packed up and started north
on the North Star Road.
Averaged road 8100 at camp,
7700 at Fork of Rocky Cr. 8200 on
highest ridge of Mesa, 8000 at
rim of both sides of Black R. Canyon
7200 at bottom of canyon at Diamond
Bar Ranch ♀, and 6800 at
Diamond Creek.

It is pretty pure Transition zone
all the way except the hot slopes in going
out of Rocky Cr. and along the hot
slope of Black Canyon. The bottoms
of both Black Canyon and Diamond
Cr. are mainly Transition, full of
yellow pines & Populus angustifolia.
The mesa tops are mainly open,
yellow pine forest with scattered nut
pines & checker board junipers and
on warm slopes Aurora arizonica.
Grass is generally good but especially
so between Black R. & Diamond Cr.

The bottom of Black Canyon is
narrow, but flat & rich & gives long
narrow meadows of good hay land.
Beautiful groves of Populus angustifolia
grow along the river and some

Animals seen.

boxelder and walnut trees are scattered along. There are lots of rock squirrels & I saw fresh corn tracks.

The steep canyon slope facing SW is mainly Upper Sonoran, covered with live oaks (*Arizona* mainly) and nut pines & junipers & *Cercocarpus parviflorus*. The mesa tops are largely open grama grass country north of Black Canyon, but yellow pines are the principal edge & gulch timber.

Diamond Cr. valley is very open but both slopes are mainly yellow pines. The flat bottoms are beautiful open groves of *Populus angustifolia* & a few yellow pines. No body lives here now, but there is an old log house & fenced field of weeds & grass. The bottoms are 40 to 60 rods wide of good yellow sand sand.

Along the sides are low cliffs of conglomerate shelf rocks that show shallow caves & in these are old cliff storage places like the cliff houses but smaller.

East Fork Gila.

Aug. 25. Caught Neotoma (fallax?) ad.
tillii Pterognathus and stopped
to make up skins so did not get off
till noon. Crossed over a 400 foot
ridge and down to the east fork of the
Gila at 6700 feet, then up it about
3 miles to north of Beaver Creek at
6800 feet & camped on the site of
old Fort Vincent.

✓
The narrow flat bottoms & cold
slopes of the East Fork are transition
with Populus angustifolia & Pinus ponderosa,
but the warm slopes are Upper Sonoran
with both junipers, nut pines, blue oaks (caribaea) & yucca baccata. There
are lots of walnuts along the bottoms &
a few boulders, Celtis, & one alder.
Lava or metasomitic rock walls border
the narrow river flat most of the way
usually 40 rods or more apart but
in places narrowed up to a low canyon.
Above this river the valley slopes
are gradual, with good grass &
open or scattered timber.
No one lives along the river as it is
all VXT range.

To Beaver Lake

Aug. 26 Rained hard most all night &
we caught only a few Piromys & a
Neotoma along the cliffs. A Lynx
came part close to camp in morning
& I shot a Eutamia sonoriensis on the rocks.
Heard rock squirrels.

Broke camp about 9 and climbed
onto high mesa (7400 feet), then down
to Beaver Creek at junction of Corderoy
& up Beaver to VTT ranch and about
2 miles above to Beaver lake and
camped on west mesa about 100
feet above lake at 7500 feet by aneroid.

After reaching the top of the first
long slope of Upper Sonoran junipers,
nut juniper & blue oaks we struck into
open yellow pine forest that continues
all the way except on local hot
slopes. There is much open grassy
mesa tops and valley bottoms & to the
N.E. there are great green mesas
& the Prairie Mts. a grassy range
of smooth high hills.

Beaver Lake is about a mile long
& 40 rods wide, between high cliffs
of the old creek valley. It is not
very deep but seems to be 8 or 10 ft in place.

Beaver Lake, Gila Nat. Forest.

Odocoileus hemionus - A good many fresh tracks & old bones seen along the road.

Antilocapra - Hotchkiss says there are more antelope in here near Beaver Lake than any place he knows. When camped here last January trapping wolves he saw antelope every day & thinks there were 600 or 700 in this vicinity.

He counted as high as 80 in a bunch. Says they are common on the Cooney Prairie between the Black Range, (just west of here) & the Elk Mts. & that some get onto the mesa south of this little "Black Range." Also a few on the mesas on head of Indian Creek, south of Corduroy last winter, about 20.

He says a band of some 25 Navajos were in here last winter hunting deer & antelope & he thinks they got a big lot of both. He saw an Indian trying to sneak into a bunch by carrying imprint of him, a loop of cloth painted to represent an antelope, but one of the cowboys saw it & began shooting and scared them off. The Indian followed after the bunch and probably got another chance.

is formed by two opposite side gulches that have washed heavy fans across Beaver Creek channel & dammed it up. The water is fresh & good & there are weeds around shore. A marsh a mile below furnishes good breeding ground for some birds, but ducks are said to be common on the lake at all seasons, especially in winter. There are 7 species here now, ¹³²Mallards, ¹³⁵Gadwall, ¹⁴⁰blue & green winged teal, ¹⁶⁷Ruddy, ¹⁴⁹Scaups, ¹⁴⁶Redhead also ²²¹Coots & a lot of sandpipers. ⁴⁹⁷Yellow headed blackbirds, ⁴⁹⁸Redwings & ⁵¹⁰Grackles are common in the marsh below & rails were heard there also. The gulches are full of timber, yellow pines & Gambel's oak, & bushes along the base of cliffs. Good cover for birds & mammals.

Birdseye was anxious to set wolf traps so he & Hotchkiss went out & set 3 before dark.

Hotchkiss says there were lots of wolves here last winter

Cervus merriami, Hotchkiss saw a fine bull elk "in the N.E. corner of the Mogollons (on Lily Mts.) in 1894 and tracks of three elk were reported by a ranch man the same year. These are the last elk Hotchkiss knows of being seen in this region.

Entomias dorsalis, common all along on rocks & canyon walls. Found at mouth of Beaver Cr. eating ripe fruit of big Opuntia like engelmanni. It had its cheeks full of seed and its nose was purple with the juice.

Two were killed (a bull & cow) by Spence Hill in the Mogollons about 1890, Hotchkiss says. Hill owned the Gila Hot Springs then. The horns ^{head} were in silver for a long time but were sent by Hill to his father at Coffeyville, Kansas. It was said to be an unusually fine head.

Beaver Lake

Aug. 27. Hunted ditches & water beds, mainly with field glass and got a good bird list. Found where a Porcupine lives in a rock den. There are lots of prairie dogs, C. manicata. Saw antelope tracks close to camp.

Aug. 28 - Broke camp and followed up Houghton Canyon west of lake about about 6 miles, then out onto open mesa and a few miles over it at about 8000 feet, then up a long dry gulch and over an arm of the Elk Mts. at 9000 feet down the west slope about 4 miles and camped in gulch at 8400 feet. Have been nearly straight west all day probably 15 miles.

The country is all transition zone except the steep south slope of Houghton Canyon which is covered with nut pines, Junipers & black oaks. The rest is yellow pine & Gambelsoak along gulches and over mountain ridges and the mesas are open, grassy plains but without transition.

Canis lupus, Saw lots of wolf tracks
made last night & night before
on the high mesa at head of
Houghton Cr. Canyon. Three or four
had been along the road together
& some were very large.

This is ideal country for them.
Odocoileus hemionus. Saw one large
bull with big horns on the mesa
at head of Houghton Cr. Canyon &
a fawn & doe at the salt trough,
where we camped as we rolled
up. All were in the red coat &
the buck's horns were nearly full
grown.



There is no water in this part of the
Elk Mts. & they are covered with open
and rather scrubby timber of yellow
pine & Gambel's oak ~~except~~ in the draws
where there is a fine stand of big
yellow pines. One little bunch of
aspens in a cold gulch was the
only trees of Canadian. There were
few signs of mammals or birds.

The mts., as the whole country, are
of lava rock and very stony but
of good soil & yield good grass.
The peaks to the north of our camp
which seem to be the real Elk Mts.
are much higher & seem to have
Canadian zone timber on the cold slope.
A great stretch of high mesa
country lies to the west of us &
reaches across to the timber of
the Mogollons. It must be all
above 8000 feet & mainly transition.

Elk Mts.

Aug. 29. With barometer reading 8600 at camp we followed a mile down the gulch to Canyon Creek (about 8500) then up it past an old lava basin lake and the stone wall, then west over a high mesa and onto a branch of the N. Fork of Gila, then onto high mesa again north of it and along south base of the real Elk Mts. to edge of timber on mesa across first creek out of Elk Mts. Crater & camped at 8600. Rained from 8500 to 8600 all day over magnificent grassy mesas, usually stone and often typical washes but with rich soil & fine grass. There has been much rain & streams are mostly running & grass is luxuriant and flowers are abundant & brilliant. A few *Pinus ponderosa* & *Quercus gambeli* come down the gulches & the mesa plants are all transition or neutral. *Athanasia ficioides* is one of the characteristic species. There are many cattle on the range but not enough to keep the grass down. This is still V+T range.

Stone wall

Nearby we struck Camper Creek
An old stone wall crosses the valley
and follows the eastern rim a mile
or two where we could see it, but
we did not see the other two sides
of an enclosure. It is in a rectangle
crossing the valley east & west &
following the side North & south in ~~straight~~
lines. It has been a good sized
wall, 5 or 6 feet high & wide, but
seems to have been in ruins for
100 years or just as well a 1000.
No one knows its origin or history.
Hatchie says & he thinks it extends
for many miles.

It could have been used as an
antelope or elk enclosure or
pasture but seems unnecessary
and would not serve as a trap
or pound. More likely it was a
sheep pasture built by some of the
early settlers. It is on lava plain
where broken lava covers the ground
& the stones used are such as cover
the country.

Elk Mts.

Camped on mesa in edge of yellow pines at S.W. base of the real Elk Mts. at about noon. I walked 2 miles to the base & then climbed to the highest peak of the rim of the old crater, 10200 feet, and followed half way around the rim of rough lava rock. The crater opens out in 2 gulches to the S.W. with good streams flowing down these. The slopes are steep & rocky with aspens and pines down to 9000 feet in cold gulches and on south slopes above 10000 feet. *Pinus flexilis* & *Pseudotsuga* are abundant on cold slopes from 9000 to the top and *Vaccinium globosum* & *Radiata* *impressa* are common on cold slopes.

Transition zone runs up to 10000 on the SW slopes with scrubby *Pinus ponderosa* & *Aristostophylos uva-ursa*. All around the base of the mts. is good forest of yellow pines & in the draws if it is unusually tall & large. I measured one fallen tree 4 feet through at base and 150 feet long, & there were lots more like it standing.

To Negrita Cr. at Runup.

Aug. 30 Broke camp at 7:30 ad in about a mile struck the forks of Snow Creek, followed up it ad then west across open mesa to the divide & down Beavardam Creek to the Negrita ad camped in canyon near Hump Ranch. Avoiod at camp 8650, on Snow Cr. 85, on summit 8600, on Negrita 8000, on mesa south of Canyon 8000, at camp in canyon 7200. Struck into yellow pine woods at head of Beavardam Cr. & kept in it all the way except on a big open mesa crossed before the last descent into canyon. The Mogollon Mts. rise steeply from the Negrita ad on steep rocky N & slopes ✓ *Picea pungens*, *Abies concolor* & *Aspens* come down to the creek. On more gradual slopes Canadian zone begins higher up. ✓ *Pinus ponderosa* & *Populus angustifolia* follow the creek bottom all the way down but the hot slopes above the bottom are mainly covered with Nutpines, junipers & blue oak (*B. arizonae*).

The Tuhroza Mts. come down close to the Negrita on the North but a strip of Upper Sonoran covers the lower S.W. slopes, the Transition zone timber comes down the gulches and makes perfect connection across the canyon & the Mogollons, as it does also across in a solid body to the Elk Mts.

The upper Negrita canyon is a beautiful narrow valley with open pine woods, a beautif~~tt~~ stream and good camp grounds all along. There are a few old cabins but no occupied ranches. The trail is good most of the way except a few rough narrows and steep stony trails up onto the mesa & back in below.

At a salt trough we saw a little white tail buck & doe & Hatchiss shot the buck, a two year old in the gray coat & 2 point velvet horns. We carried it along on the pack & skinned it at night. Would weigh about 75 lbs.

To Fries & Reserve

Aug. 31, Followed down Negrito Cr. to the Tularosa & the Tularosa to the San Francisco R. & up it to Fries & Reserve and camped in Mr. Hamby's pasture a mile north of Reserve.

Averiod at Camp 7250, at Tularosa River 6200, at Fries about 6200 and camp 6200.

The Negrito canyon is a beautiful wild gulch with high lava walls in places narrowing up to a very rocky gorge, & again widening out with beautiful wooded bottoms, tangled up with grape vines.

Down to near the lower end of the canyon the cold slope and moist bottoms are transition with yellow pines, & Douglas species, ^{Tamias scapularis} and ^{Perognathus} *angustifolius* predominating. The hot slope and more open lower end of canyon all Upper Sonoran covered with *Juniperus osteosperma* & *monosperma*, *Pinus edulis*, *Quercus arizonica*, *Cercocarpus parviflorus*, *Yucca baccata*, etc.

No one lives in the canyon below the Hummer Ranch.

A fine stream of good clear water all the way is said to be permanent. There are beautiful spots for camps all along. Under groves of Cottonwoods or Pines or Junipers or walnuts with open park like clearings and peaks and cliffs and caves to be explored.

After Deer tracks were numerous at salt licks and Abert squirrels rock squirrels and chipmunks were common all along. Molar houses were seen in rocks and brush piles and old beaver stumps were numerous.

One Cottonwood tree cut half down by beavers measured 24 by 26 inches at the cut. - see photo. But the beavework is all old 10 or 20 years at least.

At Fries they say fruit does not do well on the river bottoms. Our apple orchard has yielded on two years in 7 on account of frosts. We are tried ^{and} ~~and~~

Reserve

Sept. 1+2. Camped in Mr. William Handby's pasture a mile north of Reserve, under live oaks, junipers & yellow pines by a good spring. Packed specimens and wrote letters and got supplies for the next trip. Did a little collecting but left most of it for Goldman later.

There are ruins of old pueblos or at least two points in the pasture to others on nearly every point along the valley. Some were only single stone houses, others large groups of houses that have fallen down & leave only outlines of the walls. A few holes have been dug in some but they are mainly undisturbed. The town of Frisco stands on one of the large ruins, but a smaller and less flattened mass stands on a point a quarter of a mile

Up San Francisco Mts.

Sept. 3. Left Reserve and followed up Campan Bonito due west to the foot of the mts. + then out over a mesa + up a steep slope to the top and camped on top of main ridge about 6 miles east of Lava. Aneroid at Reserve read 6200, where we left creek 8 miles west 7300, top of timbered mesa 7500 to 8000, top of ridge at camp 8600, from camp I climbed the highest ridge in the vicinity, about 500 feet above, but forgot to take barometer.

Practically the same set of plants + birds + mammals occupy these sets. as the Mogollons, and the zone limits are essentially the same.

Upper Sonoran zone covers the foothills up to about 7000 feet on open places but extends up to 8000 on SW slopes and even to 8500 on steep rocky SW slopes. It is characterized by *Pinus edulis*, *Juniperus pedunculata*, *rovosperma*, and a few trees of the large berried junipers —, by *Quercus arizonica*, *Juglans major*, *Cirsus parvifolius*, *Garrya*, *Rhus trilobata*, *Yucca baccata* + glauca, *Opuntia aciculata* + a flat *Opuntia*.

San Francisco Mts

Transition Zone begins on the uplands at about 7000 feet on N.E. slopes, but extends down dry stream bottoms mixed with Upper Sonoran. *Pinus ponderosa* & *Populus angustifolia* run down to Reservoir and down the Frisco Canyon far below. On S.W. slopes *Pinus ponderosa* begins at about 8000 feet (except on very steep slopes) and extends to the highest peaks, a little above 9000 feet. On the N.E. slopes it is replaced by *Abies* Canadian zone species above 8600 except where the slopes are very steep. *Robinia neomexicana* & *Quercus gambeli* have the same range as *ponderosa* while *Pseudotsuga* & *Pinus strobus* overlap the upper part of Transition. The little *Castanopsis* & *Berberis* are abundant in Transition.

Canadian zone covers the steep N.E. slopes of the Mts. from about 8500 to the tops, running lower in steep gulches & disappearing from slopes that are graded. It is marked by *Abies concolor*, *Populus tremuloides* and a mixture of *Pinus strobus* & *Pseudotsuga*.

To Lava Valley.

Sept. 4. Hunted over the Mts. all of forenoon and climbed the highest peak to the north of the trail, only about 8800 feet. The lowest notch in the Mts. south of the San Francisco River Canyon is about 8500 feet until beyond the long ridge lying south of where the trail crosses. Canadian zone is not very strongly marked or pure even on cold slopes, but it follows down gulches to below 8000 in steep rocky places.

The trail continues west along the top of long ridges and then drops down a long steep slope to near the valley floor. It has been built by forest rangers and most of the work has been in flaying trees. Almost every tree near the trail and often 5 or 6 in a group are blazed on both sides deep into the wood and for a space 2 to 6 inches wide and one to 2 feet long with a deep notch cut in above. On a small tree half the circumference is barked & thousands of thrifty young pines are ruined.

Zuma Valley.

At Camp the average road 8600 at Zuma Valley 7500, at camp at upper end of valley, a mile west of P.O. Thos. Zuma Valley is some 2 miles wide and 4 miles long, probably an old lake bed, with high rimrock on the north, and forested slopes on south and mountains on east & west. The level open part contains half a dozen ranches where grain and a few vegetables are raised, but many old fields are abandoned.

Except a narrow rim of higher Sonoran blue oaks, junipers & nut pines along the northern rim high above the valley the whole valley is transition. Groves of big yellow pines grow scattered over the valley & narrow leaved cottonwoods extend along the river bottoms. *Quercus gambeli* grows along the edges of the valley and a few boxelder on the flats. A yellow Senecio weed covers the valley with a robe of its light yellow. *Athanasia fragrans* is abundant.

Zera Valley

Sept. 5th. Remained at camp trapping up the canyon but without much success. Found some bear signs, plenty of coon & fox & cat & coyote tracks & a mink track, but could not stay long enough to begin catching them - got plenty of small stuff, *Neotoma*, *Microtus* *mogollonensis*, 3 species of *Peromyscus* chipmunks, ground squirrels etc. & 2 species of bats.

Sept. 7, Broke camp and struck west on the Springerville road, up over high ridges to 8400 feet then on the same level to Bush Valley, where we came close to the south side of the Escudilla Mtn. and decided to go up it, so turned north & camped in a gulch on its south side at 9000 feet. at a little spring.

Came through transition zone forest all the way with yellow pines & a few Douglas spruce & Gambel's oak. On the lower hot slope slopes there were still blue oaks & junipers up to about 8000 feet.

Escudilla Mtn.

Camped about noon and started up the mountain at once, riding up the trail to the great open, grassy park on the first peak at 10100 feet, here we parted. Hotchkiss swinging around in the spruce & aspen woods to hunt bear and Birdseye & I striking across north to the higher peak, and reaching the main part at 10800 feet. There is still a higher peak to the north that must be fully 200 feet higher, but we had not time to reach it.

Spent all the time we could hunting bluegrouse through the spruces but did not find any. These mts. are two old craters with circular rims, and are formed of lava, as are almost all the rocks of this country. They are steep and rough but a good trail goes up the stream of the first mountain & then across about 2 miles of beautiful grassy parks to the second. This flat part has several small lakes & numerous streams & springs flowing N.E., probably to the Nutria. Dense Canadian gray forest covers all the upper part above 9500 feet

on southwest slopes and above 9000 feet
on N.E. slopes or in gulches (or
lower, as we did not go below 9000 ft).
The zone is marked by *Picea pungens* &
engelmanni, *Abies concolor* & *arizonica*,
Populus tremuloides, and in part by
Pseudotsuga & *Pinus strobus*.
Also by *Juniperus communis*, *Salix*
cordata(?), *Ribes* *tippinii* & *cereum*(big),
& numerous small plants.

Transition zone runs up to 9500
feet on SW slopes but stops below
9000 on N.E. slopes. It is mainly
Pinus ponderosa & *Quercus engelmanni*
with a mixture of *Pseudotsuga* & white
pine at the upper part.

To Nutrioso Arizona

Sept. 8. Broke camp and came back into Bush Valley, and west thru Alpine and over the pass to the Nutrioso and down to Nutrioso^{town}, about 3 miles west and camped on mesa. Aneroid at morning camp 9000, at Alpine 8400, at Summit 9100, at Nutrioso 8400, at camp on mesa 8500.

The western part of Bush Valley is largely settled & cultivated in a careless way, in such crops as marsh hay, oats, wheat, potatoes & vegetables. Some of the fields are irrigated & others not. Many old fields are abandoned & the fences torn down. The houses & people seem poor and slovenly. Stock raising is the principal industry & grass is plentiful & good. There is lots of water and the valley soil is rich and heavy, but the climate is too cold for successful farming. The valley is all transition zone and the west end close to the edge of Canadian.

Heavy yellow pine timber surrounds the valley and makes beautiful open forests. Much has been cut for log fences & for building but more remains.

A high, steep lava ridge runs all along the south side of the valley & continues west into the White Mts. Its steep north slope is pure Canadian zone to the base, covered with dense forest of spruce, firs & aspens.

At the West end of Bush Valley we turn north & follow up a small creek between the Escudilla & White Mts to the pass at 9100 feet, then down a long gulch to the Nutriosa Creek. Both Canadian on cold slopes & gulch bottoms and Transition on hot slopes go through this pass. Both Canadian & Transition species have free access through the pass.

Down the long gulch from the summit to Nutriosa Creek it is Transition zone yellow pine & Gambel's oak forest on the warm slope and Canadian spruce & aspen on the north slope.

On Nutriosa Cr. the valley is Transition, ~~but~~ but a tongue of Upper Sonoran runs up the steep south slope of the valley wall about 2 miles above the town of Nutriosa. ~~This is~~ This is marked by nut pines, *Juniperus procumbens* & *variegata*.

At Nutrioso the valley is mainly transition with upper Sonoran species on warm slopes. Besides nut pines & junipers on the slopes the bottoms are covered in places by *Helianthus annuus* "Helianthella", Cleome etc, but more of it by *Polygonia* & *Astragalus fragilis* & other transition zone species.

A mile below Nutrioso we turned west across the valley & climbed onto a mesa 100 feet above & camped under juniper trees.

The farming along the Nutrioso Valley is mainly grains, wheat, oats, rye etc. Crops are good but weedy & neglected generally. Most of the fields are irrigated. The soil is rich, heavy lava adobe with enough mixture of sand to make it workable.

The whole country is lava overlying sandstone, which latter crops out here & there along the sides of the valley.

Springerville, Ariz.

Sept. 9. Continued across mesa west to a creek that runs down to near Springerville & followed down this to the town. Got supplies & visited the Forest Supervisor Warren & the photographer & trapper, Clay Hunter. Then I crossed to west side of the Little Colorado & followed up its valley on mesa about 12 miles to edge of mountain timber & camped after dark. Acreoid road 7500 at Springerville - 500 feet too high -
and ~~7200~~ feet higher at camp. The dry flats & south slopes about Springerville are upper Sonoran zone, but cold slopes down to near the town and the wet bottoms seem to be transition. Nut pines & both junipers cover the foothills and the valleys are a golden glow of *Helianthus annuus*, "Helianthella", *Crassula grandiflora*, *Gutierrezia*, *Pigelovia canescens* & small green *Succowia trigona*, etc. Along the river bottoms at willows, narrow-leaved cottonwoods, etc. There are extensive wet marshes & flat fields of grass or grain.

The whole valley bottoms are in fields of grain & hay. Little else is raised except vegetables. There are a lot of peach, apple, plum & cherry trees here, but the people say they get fruit once in about 7 years. Late frosts kill the young fruit. Last spring a hard frost about June 3 killed all the fruit. They say the spring is early & warm even in February, & trees start too soon. If they could be kept bare, as one woman said they did one year by keeping snow around each tree, a good crop could be raised.

Sheep are the principal stock & industry of the country. & they are wintered all around here in the valley. Snow rarely gets deep or lays very long & the sheep are run over the slopes & rimes. I never before saw such gramma grass, knee high and over much of the country a ton to the acre could be woved. The sheep have not come down into the valley yet, except west of the river

where we passed 4 or 5 big flocks of
about 2000 each. Even here they
had not eaten the heads off the grass.

The whole valley & surrounding
country is lava, and craters, big &
little are seen on all sides.

In going up the river valley we passed
5 or 6 beautiful craters, some of low
Lava craters, others
of steep cones  of lava & cinder.

On the mesa it is all transition
zone again & the little canyon
where we camped is full of oaks.
This is a lava rock box canyon about
fifty feet deep.

To Camp on Little Colo at 8500 feet.

Sept. 10. Continued over open yellow pine mesa about 5 miles to where we strike the Little Colorado River at a mile or two below Greer, then up about 2 miles above Greer & camped in the canyon at about 8500 feet on the yellow pine slope. The opposite slope (NW) is aspen, spruce & fir from top to bottom. The canyon here is about 600 feet deep with steep sides & narrow bottoms. The creek is a roaring stream just too big to jump across & heavily fringed with alders & willows. A little open slope gives us a beautiful camping place with good Canadian snow trapping ground along the stream & at the cold slope.

Reached camp before noon & worked on reports till time to set out traps.

Up White Mtn. Peak.

Sept. 11. Left Beidseye to go to traps & finish bird report & started early in morning for the peaks. Climbed out of canyon on east side & followed mesa about 10 miles south, then up ridge about 5 miles west to top of Thomas Peak at 11280 feet. Did not have time to go over to Old peak, still 3 miles farther west & about 200 feet higher, but Thomas peak is sharper & rougher with more of a timberline on cold slope.

Found it an easy climb & could have ridden a horse to the top if I could have gotten him out of the canyon at camp. Found the distance greater than I expected & did not start down from the peak until 4:30 P.M. so did not try to get back to camp. Spent the night in an old burning on the lower slope of the mountain at about 9500 feet. Made a rough bed against a log & kept a fire burning & slept by spells all night.

Found little sign of game and the forest and mountain tops are extremely lifeless for such ideal conditions. Grass is abundant in

Found a little chipmunk like
Eutamias amoenus on the very top
of Thoros peak & got 2 specimens.
Saw no more. Also got 2 Picoides
& a female bluegrouse, all good
records.

the parks and open & on peaks, but the
woods are carpeted in great part by the
little blueberry (*Vaccinium cespitosum?*).
Generally this has little fruit, but at about
10,000 feet there are a few ripe berries
as well as a few ripe strawberries.
Lower down in the burns there are abundance
of red raspberries & spiny gooseberries,
and the blushed blue currants & the little red
gooseberries (*R. cuneata*) run to the peaks.

Sheep are the principal stock in
the mts. but there are not enough to eat
half the grass this year. The big mesa
parks from 9,000 to 14,000 feet cover miles
of country & are still ~~pruned~~ ^{laid} up in grass.
They are full of little lakes & streams
and every basin is now full of water.
There are lots of trout in the streams
& the ducks are coming into the
ponds. I counted 35 mallards & 3
¹³⁹ greenwing teal in one small session.
There are no ranches on these
mesas except farther east where
some could be seen in the distance.
The grassy parks are all in Canadian
zone & surrounded by aspen, spruce &
fir timber.

Back to Camp

Sept. 12 Hunted all the way back to camp but found little save a flock of Bluegrouse. Got 2 old males which with the ♀ shot yesterday form the same flock makes good start on a series.

At Camp found Hotchkiss had killed 3 turkeys & brought in 35 fine trout while Birdseye had a fine lot of *Microtus monticola*, *Ereotomys*, *Thomomys talpoides*, *Peromyscus maniculatus* & 2 *Sorex*. A half a dozen fine squirrels & a chipmunk. Was hungry & very weary when reached camp, having tramped about 30 miles with only a small lunch & zeros for 3 meals.

Sept. 13 to 15 - Remained at camp, trapping, making up specimens and writing reports. Hotchkiss kept us supplied with trout and our turkeys and grouse collected for specimens furnished plenty of delicious meat. The horses found equally well as the warm slopes of the canyon are covered with a large Vetch loaded with ripening fruit that they are very fond of.

To Springerville

Sept. 16 Had traps to bring in and a lot of skins to wake up before starting, so did not get off till 9:30. Got a skunk & the woods cottontail and two Neotomas of the pintown? group.

Came back over the same old road to Springerville and camped in town to ship specimens.

Sept. 17, Got a late start (10:30) and came down the St. Johns Road as far as Las Tunas, (23 miles) and camped by the Little Colorado at about 6000 feet. Came all the way over lava fields and among old craters. Good grama grass and lots of big herds of sheep. There are many sinks & basins and reservoirs full of water but no small streams. The Little Colorado runs in a deep lava canyon until it opens out at Walnut Grove and still more at Las Tunas where the road goes down into the river valley to the sandstone levels below the lava cap.

To St. Johns

Sept. 18. Birdseye caught 3 Neotoma lepida
+ a Peromyscus truei + tigrinus. + shot
Lepus arizonae. We saw Citellis grammurus
and lots of Cynomys leucurus + tracks
of Perodipus. I had reports to finish
+ filters to write for mail at St. Johns.
Got off at 9:30 + reached St. Johns at 1
got supplies and camped 3 miles
below town on east side of river
+ got out all the traps we could before
dark. Camped in typical badlands
or a part of the Painted Desert and
slept on fossil beds among bones
of mammals.

The river valley grows wider below
Las Vegas and at St. Johns is a
broad farming valley with extensive
fields of grain and alfalfa + corn and
sugarcane (sorgum). The soil is rich
gumbo but poorly cultivated + crops
are not very good. Fruit trees
grow in town, lots of peach and apple
+ pear trees but little fruit.
Apples and pears are shipped in from
Concho where there is now fruit
this year.

To Zuni River

The whole valley from Springville
to St. Johns and below is Upper
Sonoran zone, with *Juniperus monosperma*
on the hills, wide leaved cottonwoods
at a few places along the river, lots
of *Festuca*, *Atriplex canescens*,
Eryngia lanata, *Oxybium pallidum*,
Croton texensis, *Chiono integrifolia*,
Helianthus annuus & *lanceolatus*? *Helianthella*

, *Gutierrezia* , *Bigelovia*
, *Cassina grandiflora*, *Yucca glauca*
and other species of the zone.
Cowenia sulphurea and *Dalia speciosa*?
were found on rocky slopes at last two.
Coccolle bars, *Argemone*, *Mentzelia*,
a little flat *Opuntia* & a low *Cylindropuntia*
are common.

Sept. 19 Caught 3 *Reithrodontomys* & had
2 *Neotoma* to make up for last night so
did not get off till 9:15. Followed the
main road N.E. over ridge and down to
Carrizo Creek, across the valley and
over another ridge to down to Zuni
River valley, and camped on north side
two or three miles below the Windmill.
Came about 15 miles from St. Johns.
Camped early and set out a lot of traps.

The lower part of both Carrizo and
Zuni valleys are typical Painted Desert
with bare badland slopes & buttes in
strata of rainbow colors. Fossil bones
are abundant over the surface in
places and fossil logs are numerous
in others. At about 6 miles out
from St. Johns the road crosses
a petrified log 3 or 4 feet in diameter
& extending along the surface in broken
sections for 40 or 50 feet. Others
are scattered over the same slope
which leads down into the Carrizo
valley. The Zuni river where we
camped had great boulders of petrified
wood in the channel & small pieces
are scattered over the ridges.

The whole country is Upper Sonoran zone
with junipers on the ridges and *Atriplex*
canescens and *confertifolia* on the flats &
hot slopes, a few *Sarcobatus* bushes along the
Zuni R., *Eurotia lanata*, *Artemisia filifolia*,
blue *Ephedra*, *Croton texensis*, *Cleome integrifolia*,
Helianthus annuus, "Hebiuthella" *Bidens*
canescens, & green leafless, a low *cylindropuntia*
and a small flat *Opuntia* and on hot
slopes a very rank odored *Datura* are
common plants.

The deep channel of the Zuni River is
usually dry but we found pools of good
water in the hot holes at deep bends.
Grass is good on the ridges and
abundant over the valley, but mostly
sagebrush & poor kinds. There is
little stock in the country & the unusual
amount of rain this season has
given the grass a great boom.

Up Zuni River

Sept. 20: Caught 2 species of Neotoma,
a Rithrodontomys (not megalotis) & Onychomys
pollicatus, & *Ammospermophilus umbrinus*,
Failed to get a Perodipus or Perognathus
as both refused to touch bait.

Stopped to make up 8 mammal skins and
did not get off till 9:15.

Followed up the Zuni valley past the
Windmill & Deer Spring, both abandoned
ranches, and on to beyond the New
Mexico line, & camped on the big open
valley above the canyon. For 8 or 10
miles the river valley canyons up with
high sandstone mesa on the north and
a lava capped mesa on the south,
both covered with junipers & nut pines.
The valley bottom is flat and the river
channel deep with cut banks and most
of the very dry except a small stream
through the rocky part above Deer Sp.
This is springy in places & the water is
alkaline. The pools where we camped
are also very alkaline, the remnants of
floods. The valley is upper Sonoran all
the way and also the mesa tops. At Deer
Spring 4 or 5 yellow pines grow on south edge
of mesa, but no others were seen even

cold slopes. A few dwarfed *Populus angustifolia* grow at a springy place in canyon and at an old ranch above the canyon. Junipers & nut pines cover the mesa tops both sides. Foresting and a big *Berberis* are the main shrubs in the canyon. *Bigelowia canescens* grows very large & a dark, twisted barrel one & the leafless one are abundant, also *Pterozizie*, *Helianthus*, "Helianthella", *Chenop* & *Croton* go all up the canyon.

There are lots of *Neotomas* & *Perodipus* signs but not a *Thomomys*. *Tilt* was seen till we camped at night where the hills of one were found & the gopher caught.

Got in camp in time to set out a line of traps. Found a dead porcupine near camp & saved the skull, also a badger.

To Zuni

Sept. 21. The alkali water made both Hotchiss & Berdseye sick so I had to get breakfast & then eat most of it. Got *Peromyscus longimembris*, *Thomomys*, & *Oryzomys*. Berdseye made up 3 skins & we got started at 8:30. Followed the only traveled wagon road about 6 miles to Ojo Caliente, a poor little pueblo along the sunny side of a hill. Then turned north to Zuni, about 12 miles. Got grain at the store and went up to a spring near the big Zuni Dam and camped. In going around by Ojo Caliente we left the river valley but came into it again below Zuni. It is a wide, level plain, of good soil but somewhat alkaline. It is mainly covered with sedentary grass *Atriplex canescens* & some *Sarcobatus*, lots of *Bigelovia canescens* & leafless & dark green twisted leaf form, *Gutierrezia*, *Crotalaria*, *Chenopodium*, *Solanum* (blue), *Helianthus*, "Helianthella", and in places a rank swelling *Dalea*. Two or three large cottonwoods of a wide leaf form grow along the stream below the Pueblo & one on a side gulch above.

Over the ridges and mesas on all sides
of the valley are junipers & nut pines
but only Upper Sonoran plants between.

Grass is generally poor owing to
overgrazing with sheep. Below Goldfield
sheep corrals dotted the hillsides as this
is winter range. Only one small herd
was seen however on the trip.

The big dam & reservoir above
Zuni is going to make a rich farming
valley for these people. The land lies
well & if there is water enough the valley
can be irrigated for 15 or 20 miles
and one to 4 miles wide.

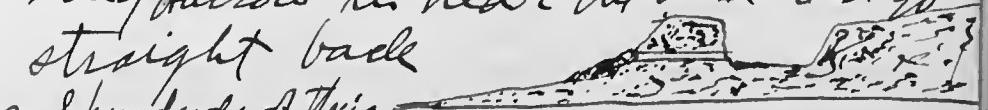
The one big ditch runs along the west
side of the valley, or north side at Zuni
and is 10 to 15 feet wide on the bottom and
2 to 6 feet deep. It is just completed
but has not been used. The Perodipus

seem to think it was built just for
their winter quarters and they come
from far & near to occupy the banks.
They burrow in near the bank and go

straight back

and hundreds of them

burrows enter the lower bank of the ditch.



Thomomys also gathers along the ditch but burrow more in the upper bank where the only damage is in filling up the ditches. Many also burrow in the lower bank where they are sure to pierce the wall. Perognathus, Onychomys, and numerous other little burrows appear in the banks and by tems to turn the water in next spring a new ditch bank will be needed. Some one ought to get busy with a line of poison along the ditches.

The Indians at present raise little fields of corn & squashes^{& beans}, here & there all over the country without irrigation. Any little sandy plot where soil is good & the water will stand after a rain is dug or plowed up & planted & left to take its chance. This year has been unusually rainy & crops are pretty good. Corn that has apparently never been touched has a fair yield of ears. & little patches of squashes in the sagebrush have good fruit. At Opolcicle some little patches of onions & chili are irrigated

Zuni to Gallup.

Sept. 22nd 23 - From Zuni we follow a good wagon road almost due north, gradually up onto higher ridges until above 7000 feet where we began to strike a few yellow pines & Gambel's oaks. Then on up and down gentle slopes over mixed upper Sonoran and Transition zone ridges, then down to about 7000 foot contour and camped 12 miles south of Gallup. From here we followed down a long gulch that leads off to the west, then over several ridges and reached Gallup at noon, got our mail and some supplies and returned half a mile on the Zuni road to camp by a big tenaja.

From Zuni to Gallup the country is dry, with only a few places of very poor water, little grass, few people and no stock except sheep. It is mainly wooded ridges covered with Junipers and nut pines almost all the way, well mixed with yellow pines and Gambel's oak on the higher ridges and cold slopes. These ridges are the western end of the Zuni Mts. which are blade and forested just east of us.

At our camp 12 miles south of
Gallup we caught *Neotoma*,
Peromyscus truei ^{*texensis*}, *Perodipus montanus*?,
Perognathus. We saw, *Eutamias dorsalis*,
Citellus grammurus, *Cynomys manicori*,
Lepus arizonae & *texensis*, *Eleothreutes*
quailings and heard coyotes.

The small alkaline stream where
we camped is barely drinkable
but this seems to be a great winter

Sept. 24-27 - Remained at our camp near
Gallup writing reports, shipping specimens,
working out accounts and collecting.

Weather windy and squally with showers
until the 25, froze hard ice before night
thick the mornings of the 24 & 27 but clear
and pleasant days.

Sept. 28 - Got supplies and started for the Tuscarora
mts. Camped about 2 miles beyond Rock
Springs on the road to Ft. Defiance.

Came about 14 miles. Camped near
some little lakes, or rain ponds of
fairly good water. No change in fauna
or species from the valley at Gallup.
All Upper Sonoran.

To Ft. Defiance, Arizona

Sept. 29. Caught 3 fine big Dipodomys
opictabilis and an Onychomys. A Perodipus
went off with a trap & I lost him.
Packed up & started at 8:30 and reached
Ft. Defiance, Arizona at 3 P.M. & camped
at the agency. Came about 18 miles.

The country is very dry and barren,
no grass most of the way, all sheeped
off and the bushes eaten off by goats.
Had to get hay at the agency store.

It is all Upper Sonoran zone, with nut
pines & Juniperus monosperma on the ridges
and Artemesia canescens and Lactuca
verniculata in the valley. Helianthus
annuus and Cleome grow where not eaten
off by sheep. ~~Saw 4~~

Transition zone shows in yellow
pines along the top & cold slope of the
big mesa west of the Arizona line and
on the big mesa east of Ft. Defiance.
A lot of scrubby yellow pines grow on a bare
rocky south slope of a ridge 8 miles
S.E. of the Agency, but grow there from some
abnormal reason.

Saw 4 coyotes & heard lots more. Saw
a few Cynomys gunnisoni & one rock squirrel.

Up Chusca Mts.

Sept. 30. Left Ft. Defiance and followed north up the Bonito Valley about 6 miles then turned east up a canyon between high red sandstone cliffs and followed it back on top of the mesa to its very head, then over into other draws and across flats and ridges N.E., and camped at a spring 2 miles NW of Chokai peak at about 8000 feet.

The mts. are sandy mesas cut up into canyons and plateaus. Out above 8000 ft on SW & NW slopes they are Transition zone, open yellow pine and Gambel's oak forest & *Pseudotsuga* on cold slopes. They are rather dry with a few springs and small streams at long intervals. The grass is good in places but has been mostly eaten off by sheep & goats. The Navajos have numerous hogans near the water place & run their sheep far back on dry ridges. They have now mostly left the mts. as the grass is dying off & it is getting cold & woolly. A few occupied houses and camps were passed & a few small birds seen.

Chuska Mts.

Oct. 1. Remained at camp all day making up specimens and hunting & setting traps. Went to top of high mesa point just north of Choister peak and got a good view of the country, colored in zone map and picked out trail to high mesa to north.

Found *Aspens* and *Junipers* common and *Ligustrum canescens* on north slope and heard a *Sciurus nozollensis*, all at about 8500 feet, a strong trace of Canadian zone.

Most of the mountains are transition zone open yellow pine timber with Gambel's oak on rough slopes.

Upper Sonoran nut pines, *Juniperus scopulorum* & *monosperma* & *Cercocarpus parvifolius* come up on ^{SW.} steep rocky slopes to above 8000 in places.

The Navajos have left the mts. with their sheep but recently. There is little grass left. Hogans are seen everywhere within reach of water. Some Siuegas are fenced in for water and horse feed, but corrals are found on all sides for the sheep and usually a summer camp, or Hogan by each corral.

Chusca Mts. & Lakes

Oct. 2. Packed up and started N.E.; climbed onto a long flat topped ridge and followed it until it joined the main high mesa and then follow good trail 2 or 3 miles N.E. through open, clean forest of fine yellow pines to the first lakes. After passing 2 lakes we struck a shallow gulch leading off to the south and camped in it by some water holes at about 8800 feet in a grove of aspens. It was cold and windy and we found this gulch well protected and the most comfortable spot available. Camped about 10 A.M. & camp about 8 miles. Set traps up and down the gulch and shot some specimens. Grass was short but the horses get enough while not working. In P.M. I rode over part 4 or 5 more lakes to the N.E. and out to edge of the high mesa escarpment of the Chusca Mts., overlooking the great barren desert of the Chusca river valley. The wind was blowing a fierce gale so I could hardly ride against it & the desert was all dust with dust.

Chusca Mts - Mammals

Odocoileus

no signs seen.

Sciurus aberti, com in yellow pines
 " *nogollensis* " in spruce gulches
Callospermophilus lateralis, com, was caught
 & several seen up to Oct. 4. very fat.
 One ran down a yellow pine & had its
 cheeks full of pine seeds.

Eutamias amoenus?, com in yellow pines,
 climb trees

Peromyscus rufinus, com
 " *sororius* "

Neotoma pallax "

Microtus woodlax "

Cynomys ludovicianus, com in spots to 9000.
 Indians drown em out.

Thomomys fossor, com at 9000 - in woods
 " *apache* " " around lakes.

* " *aureus?* 1 taken at first camp, about 8000.

Lepus talpoides, com 7500 to 9000. 2 taken.

Erethizon dorsatum, com. 3 taken ♂, ♀, + ♫.

Urocyon tracks seen in low canyons

Canis latrans, com. 1 taken.

Zapidea " dig out microtus,

Thomomys, *Cynomys* + *Callospermophilus*.

Mephitis, a few tracks & holes

Threskiornis americanus, old signs, said to be here.

Unkilled near Window, below Agency.

Chusca Mts.

Oct 3. Still windy and cold and
 a little snow flying most all day.
 Set Coyote and gopher traps up by the
 lakes and hunted in woods.
 Got a mallard & big squirrel & saw
 turkey tracks and porcupine dens.

Oct 4. Cleared off without storming but
 had a very cold night, heavy frost &
 thick ice. Warmed up with the sun
 and had a pleasant, quiet day.

Caught 3 porcupines, 2 species of
Holorhinos, (*possum + apache*) *Microtus*
monticola, *Eutamias quadrivittatus*,
 and Bidseye got *Neotoma pallax*,
Sciurus nogollensis, *Eutamias*,
Microtus & *Peromyscus*. A Coyote
 howled around camp nearly all night
 but did not find my traps up by
 lake. Set a few more traps.

Oct. 5. Caught a coyote and a few more
Thomomys. Took up small traps so
as to be ready to start in morning.
A very cold night. Ice 1 inch thick,
slept cold inspite of fire in front of tent.

Explored mountains and found a lot more
lakes. Shot 3 mallards in one deep
lake that did not freeze over. Bluebirds
were feeding on the ice of lakes.

Oct. 6 The horses scattered out and sneaked
off and hid in 3 different directions so
we had to track up each bunch and did
not get them all till noon.

Then packed up and traveled north
over top of the mountain plateau
past the big lake and beyond to
where the big trail crosses Sheep spring
on the east. Here we found wolf tracks
so camped & set out traps.

Came about 12 miles over level, open
yellow pine forest country past
dozens of little & big lakes that occupy
almost every basin. Aspen forests
cover all north slopes and fill the gulches.
Gamble's oak is abundant on rocky
crests of ridges and steep slopes.
Pseudotsuga & *Picea pungens* grow mostly with aspens.

Chuska Mts.

Oct. 7. Continued north along top of plateau over same kind of country and at about 8800 to 9000 feet. Passed half a dozen large and small lakes until we came out on rim of deep canyon with wagon road in bottom that crosses the range in deep notch. Couldnt well get down to road so camped at a little lake with fresh ³¹⁰ Turkey tracks all around and set traps. This north end of the range has long steep slopes covered densely with Aspens and *Picea pungens* and *Abies arizonicæ* along the stream gulches. There is a more extensive area of Canadian zone here than at the south end of the range where it appears only on local cold slopes the bends of canyons or north sides of ridges.

From just north of our last camp a high ridge of lava rock runs along the east crest of the range, deeply overlying the horizontal sandstone mesa. This reaches its highest point where it drops abruptly to the notch through which the wagon road passes.

Oct. 8. Hunted turkeys in forenoon but did not find any. In P.M. took a horse and went down to road in canyon and up the range north of it, the Tunicha Mts. if the wagon road is correctly located on Contour Map.

This range is largely volcanic and very rough in great black buttes and ridges on the same old sandstone mesa. There are huge buttes and cliffs of black basalt and deep enough canyons. In places the sandstone forms the floor of level valleys between the ridges.

The range is on a level with the Chuscas, 8500 to 9000 feet generally. It is generally the same with the same trees. Transition yellow pine & Gambel oak forest over the flat part & south slopes. Aspen & Spruce & fir on the higher cold slopes and in cold gulches. It is even rarer and more sheeped off than the Chuscas, as the stony slopes have but little grass to start with and this is soon destroyed.

Chusca Mts. down to Crystal

Oct. 9. Started down the wagon road to go to Ft. Defiance for mail but 8 miles down discovered the town (or subagency) of Crystal with good stores, post office & daily mail. So sent down to Defiance (25 miles) for our mail, got what supplies we needed and came back to camp. Crystal is about 2 miles east of Red Lake, (called Black Lake on the map) a large body of water in the valley. No one in the country ever heard of Black Lake. Our camp is at Cottonwood Pass, the only pass with a road across the Mts. they say. From the pass it is about 65 miles to Fruitland.

I found transition zone down close to Crystal and even beyond on cold slopes. There are strips and ridges of yellow pines scattered over the valley where ever the slope changes from warm to cold. The warm slopes and flat part of valley are upper Sonoran, either open or covered with nut pines and junipers. These extend just into the canyons on steep hot slopes, while Carragian zone aspens & spruces run half way down the road canyon on cold slopes.

A few *Populus angustifolia* down near mouth of canyon probably give the name Cottonwood to the pass.

A few Indians live in lower end of canyon and one family have sheep & goats up a mile in the canyon. At this place an Indian was taking a sweat house bath with hot stones in water in a clay oven. These sweat houses are seen by every lake and stream & spring & pool all over the mts. & seem to be much used.

The Indian who was attending to the sweat house and talking to some who are inside was entirely naked and as finely formed a human as one often sees, with heavy chest & shoulders, slender waist & good limbs.

Oct. 10, Hunted turkeys most all day but did not see any, the tracks are numerous. Saw a few bear tracks - Hotchkiss & I each shot a coyote. Birds, caught one yesterday, making 4 specimens for this range.

Down to Crystal

Oct. 11. Went down to Crystal for mail and took a short cut across the mts. & down a canyon on west slope. Found this canyon about the same as Cottonwood Canyon only not so wide or long & with a smaller stream. No one lives in it but sheep & goats are herded in the lower part.

Junipers & nut pines come up on south slope into lower part. Robins & Solitaires are common in the junipers and the Solitaires singing jubilantly. Saw a fresh bear track at head of canyon.

At Crystal the upper Sonoran zone is worked on warm slopes by Junipers & nut pines, Bigtoes, tortoise, *Teknomyia carminea*, *Guthriea*, and *Opuntia*. By *Perodipus* & *Aphelocoma*.

It is not very strong or pure.

Oct. 12. Started at noon, passed through Cottonwood pass and down onto the second bench, then north 5 or 6 miles and down to the flat of Tunecha Creek and down the creek to the Indian settlement & camped long after dark. Came about 20 miles. And from 9000 to 5500.

From the lower edge of transition zone at 7000 feet we passed through a belt of Nut pines, Junipers (*monosperma* & *scopulorum*) *Artemisia tridentata* & *arbuscula*, *Cowania*, *Cercocarpus parvifolius*, *Yucca angustifolia* & *baccata*, *Opuntia* (3 flat & 1 round species)

At about 5500 feet we left the juniper belt & came out onto short grass plains for the rest of way.

Half a dozen big, wide leaf cottonwoods are scattered along the flats & gulches at the Indian settlement, but other vegetation is scarce. *Sarcobatus* and *Atriplex canescens* & *confertifolia* are abundant on some soils.

Rocky Cr - Aug 23.

